



**State of Louisiana**

**Coastal Protection and Restoration Authority  
(CPRA)**

## **2016 Operations, Maintenance, and Monitoring Report**

for

### **Clear Marais Shoreline Protection**

State Project Number CS-22  
Priority Project List 2

February 2016  
Calcasieu Parish

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2016 Operations, Maintenance and Monitoring Report  
For  
Clear Marais Shoreline Protection (CS-22)

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## I. Introduction

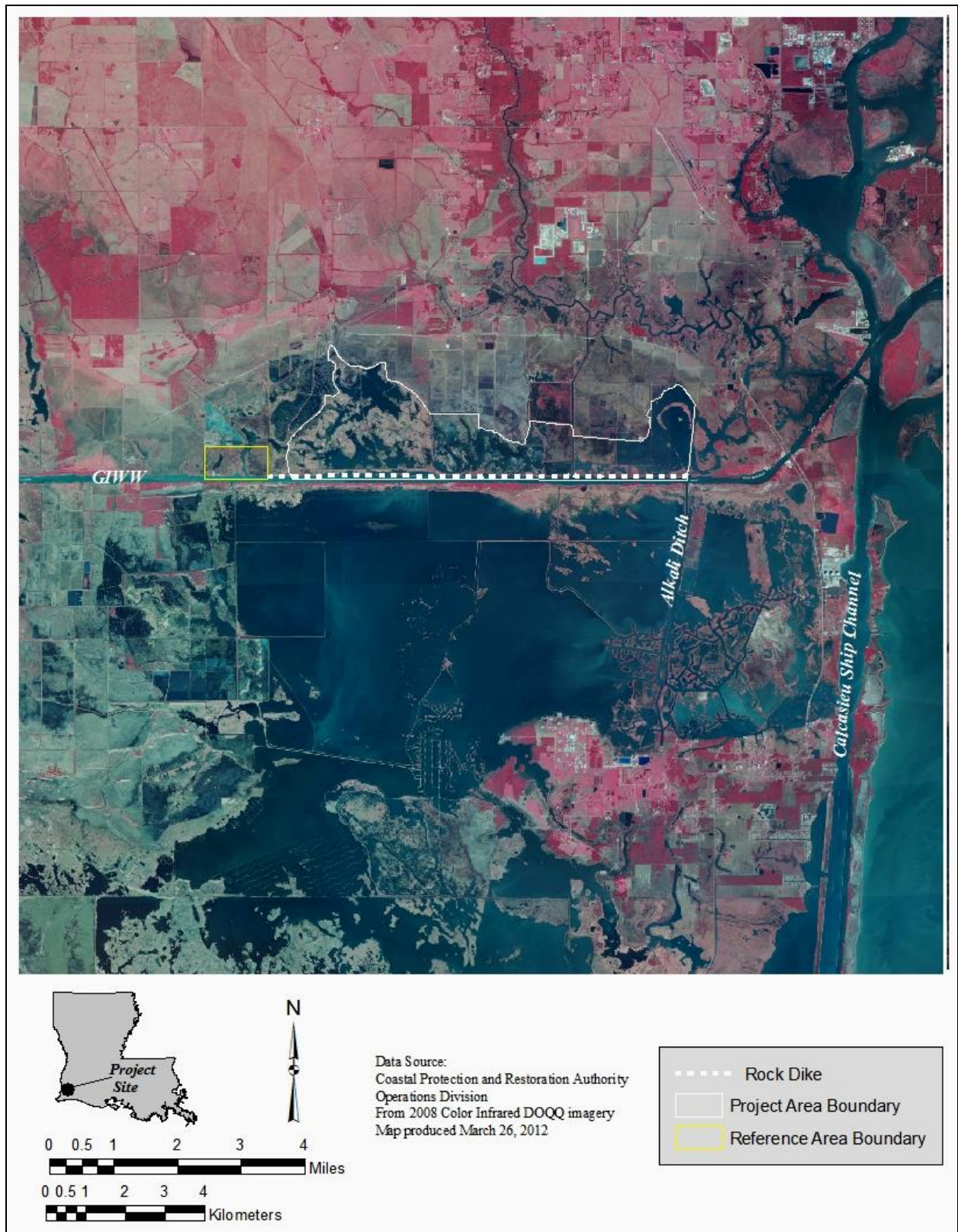
The Clear Marais Shore Protection Project was authorized by Section 303(a) of Title III Public Law 101-646, the Coastal Wetlands Planning, Protection and Restoration Act (CWPPRA), enacted on November 29, 1990 as amended and approved on the second Priority Project List. The project Federal Sponsor is the Corps of Engineers, New Orleans District (USACE-MVN) and the project Local Sponsor is the Coastal Protection and Restoration Authority of Louisiana (CPRA). The Clear Marais project has a twenty-year project life, which began in March 1997.

The Clear Marais shoreline protection project area is located along the north bank of the Gulf Intracoastal Waterway (GIWW) in Calcasieu Parish between the Alkali ditch and Goose Lake (figure 1). The project provides features to protect 3,827 ac (1,531 ha) of freshwater marsh that are threatened by saltwater intrusion and marsh loss from breaches in the GIWW shoreline. Of the 3,827 ac of fresh marsh, 1,179 ac (472 ha) are vegetated marsh and 2,648 ac (1,059 ha) are open water, with the dominant marsh plant species including *Sagittaria lancifolia* (bulltongue), *Schoenoplectus californicus* (bullwhip), and *Juncus effusus* (soft rush).

The construction of the GIWW, which was deepened to its present depth of 12 ft (3.7 m) between 1942 and 1949, provided an avenue for high-action wave energy. This wave energy is increased during high-river stages in the Calcasieu-Sabine basin (NRCS 1993). The marshes located adjacent to the GIWW are protected from rapid fluctuations of water salinity and water level by a water management levee. However, increased tidal action and boat wakes threaten to create breaches in the levee that would connect the GIWW with interior ponds and marshes. The shoreline erosion rate of the north bank of the GIWW adjacent to the freshwater wetlands is 10 ft/yr (3.05 m/yr), based on aerial photography (USDA 1992). Additionally, the present rate of wetland loss in the project area is 1.1%/yr (USDA 1992). The susceptibility to saltwater damage and the erosional forces of the GIWW threaten the integrity of the remaining acres of the vegetated freshwater marsh.

The project design included a 35,375 linear ft (6.7 mi) rock dike along the north shore of the GIWW to protect the integrity of the Clear Marais freshwater wetlands north of the GIWW. Construction on the project was completed on 03/04/97.

The 2016 report is the 7th and final report in a series of OM&M reports. It includes monitoring data through 2016, budget projections through 2019, and annual maintenance inspection results through June 2013. For additional information on lessons learned, recommendations, inspection reports and project effectiveness please refer to the Operations, Maintenance, and Monitoring Reports and Annual Inspection Reports on the official CWPPRA web site under reports at <http://LaCoast.gov/>. These reports will be made available for download at the following website: <http://cims.coastal.la.gov/>



**Figure 1.** Clear Marais Shoreline Protection (CS-22) project boundary and features.



## **II. Maintenance Activity**

### **a. Project Feature Inspection Procedures**

The purpose of the annual inspection of the Clear Marais Shore Protection Project (CS-22) is to evaluate the constructed project features to identify any deficiencies and prepare a report detailing the condition of project features and recommended corrective actions needed. Should it be determined that corrective actions are needed, CPRA shall provide, in the report, a detailed cost estimate for engineering, design, supervision, inspection, and construction contingencies, and an assessment of the urgency of such repairs (CS-22 Monitoring Plan, 1995).

An inspection of the Clear Marais Shore Protection Project (CS-22) was held on June 13, 2013 under sunny skies and warm temperatures. In attendance were Stan Aucoin, Mel Guidry, and Darrell Pontiff with CPRA, Josh Carson was representing USACE-MVN, and Frank Chapman and Brandon Samson with NRCS were present for other inspections performed that day. The boat was launched at the park at the foot of the Ellender Bridge (LA Hwy 27) over the Gulf Intracoastal Waterway. The annual inspection began at approximately 11:00 am at the eastern end of the rock dike at its intersection with Alkali Ditch.

The field inspection included a complete visual inspection of all features. No staff gauge readings were available to determine approximate elevations of water, or rock dikes. Photographs were taken at each project feature (see Appendix A) and Field Inspection notes were completed in the field to record measurements and deficiencies (see Appendix C).

### **b. Inspection Results**

#### **Site 1—Foreshore rock dike**

The dike is in good condition. As noted on previous inspections, approximately 4,000 to 5,000 linear feet of dike is below constructed elevation. This appears to be the result of slight settlement rather than displacement. Settlement of the rock dike has not worsened since originally noted and appears to have stabilized. There were two to three gaps approximately 30 feet wide where rock has been displaced by barges nosing up to the dike. These have also been noted on previous inspections and have not worsened or caused a negative impact on the project. Problems such as this are also noted on several other rock dikes along the GIWW. The dike is still functioning as intended and will continue to be monitored. There is no apparent need for any maintenance at this time. (Photos: Appendix A, Photos 1-2) Calcasieu Parish has constructed a rock dike using CIAP funding along the north side of the GIWW that tie into the western end on the CS-22 project. (Photo: Appendix A, Photo 3)

### **c. Maintenance Recommendations**

#### **i. Immediate/ Emergency Repairs**

None



## **ii. Programmatic/ Routine Repairs**

None

### **d. Maintenance History**

No maintenance has been necessary for this project.

## **III. Operation Activity**

### **a. Operation Plan**

### **b. Actual Operations**

There are no active operations associated with this project.

## **IV. Monitoring Activity**

### **a. Project Objectives and Goals:**

The objective of the Clear Marais Shoreline Protection Project is to maintain and protect approximately 35,000 linear ft (10,668 m) of management levee along the north bank of the GIWW that will contribute to protecting the integrity of the freshwater marshes of Clear Marais adjacent to the GIWW.

The following goal will contribute to the evaluation of the above objective:

1. Decrease the rate of shoreline erosion along the north bank of the GIWW south of the Clear Marais marshes through the use of a rock breakwater.

### **b. Monitoring Elements**

The following monitoring elements will provide the information necessary to evaluate the specific goal listed above:

#### **Aerial Photography:**

To document land and water acreage and land loss rates in project and reference area, near-vertical color infrared aerial photography (1:12,000 scale) was obtained pre-construction in 1994. The original photography was checked for flight accuracy, color correctness, and clarity and was subsequently archived. Aerial photography was scanned, mosaicked, and georectified by USGS/NWRC personnel according to standard operating procedures (Steyer et al. 1995, revised 2000). Based on the CRMS review, aerial photography originally scheduled for 2006 and 2015 was eliminated. The CRMS spatial viewer provides historic data for land water quantification from 1932 to 2010 and at irregular intervals as data becomes available. The year analyzed for

land water quantities through the CRMS viewer was 2010. The data provided by this tool is at a large spatial scale and is designed to show trends in land change, not exact acreages.

### **Shoreline Change:**

To document shoreline movement, 34 shoreline markers were placed at points along the vegetated marsh edge adjacent to the rock breakwater at a maximum interval of 1000 ft (305 m). Five shoreline markers were placed at the same 1000 ft intervals 1 mi (1.6 km) west of the proposed breakwater in the reference area (LDNR 1997-2000). The position of the shoreline relative to the shoreline markers was documented in 1997, 2000, 2003, 2006, 2010 and 2015. A GPS coordinate was obtained for each shoreline marker placed to maintain baseline condition over time. The shoreline was stratified into three different groups (figure 4): Group A (stations 1-9) had mild erosion and was located east of Brannon ditch to the Alkali ditch, group B (stations 10-22) had moderate erosion and was located from the Brannon ditch to the end of the management levee and group C (stations 23-34) which had severe erosion from the end of management levee to directly adjacent to the Clear Marais wetlands. Determination of land types were made through evaluation of aerial photography.

## **c. Preliminary Monitoring Results and Discussion**

### **Aerial Photography:**

Land:Water analysis of project and reference areas was conducted on November 11, 1994 (figure 2) and in 2010 using the CRMS assessment tool. In 1994 the project area had a ratio of 32.4% (1457.1 ac) land to 67.6% (3007.8 ac) water as compared to 57.6% land (2494.6 ac) to 42.4% (1838.3 ac) water in 2010. Overall the project area had a net increase in land of 56.2% (1037.5 ac). In 1994 the reference area had a ratio of 74.0% (257.0 ac) land to 26.0% (90.2 ac) water (figures 2 and 3). The CRMS assessment tool does not quantify land/water within the reference area. There is no additional aerial photography planned for the reference area of the project.

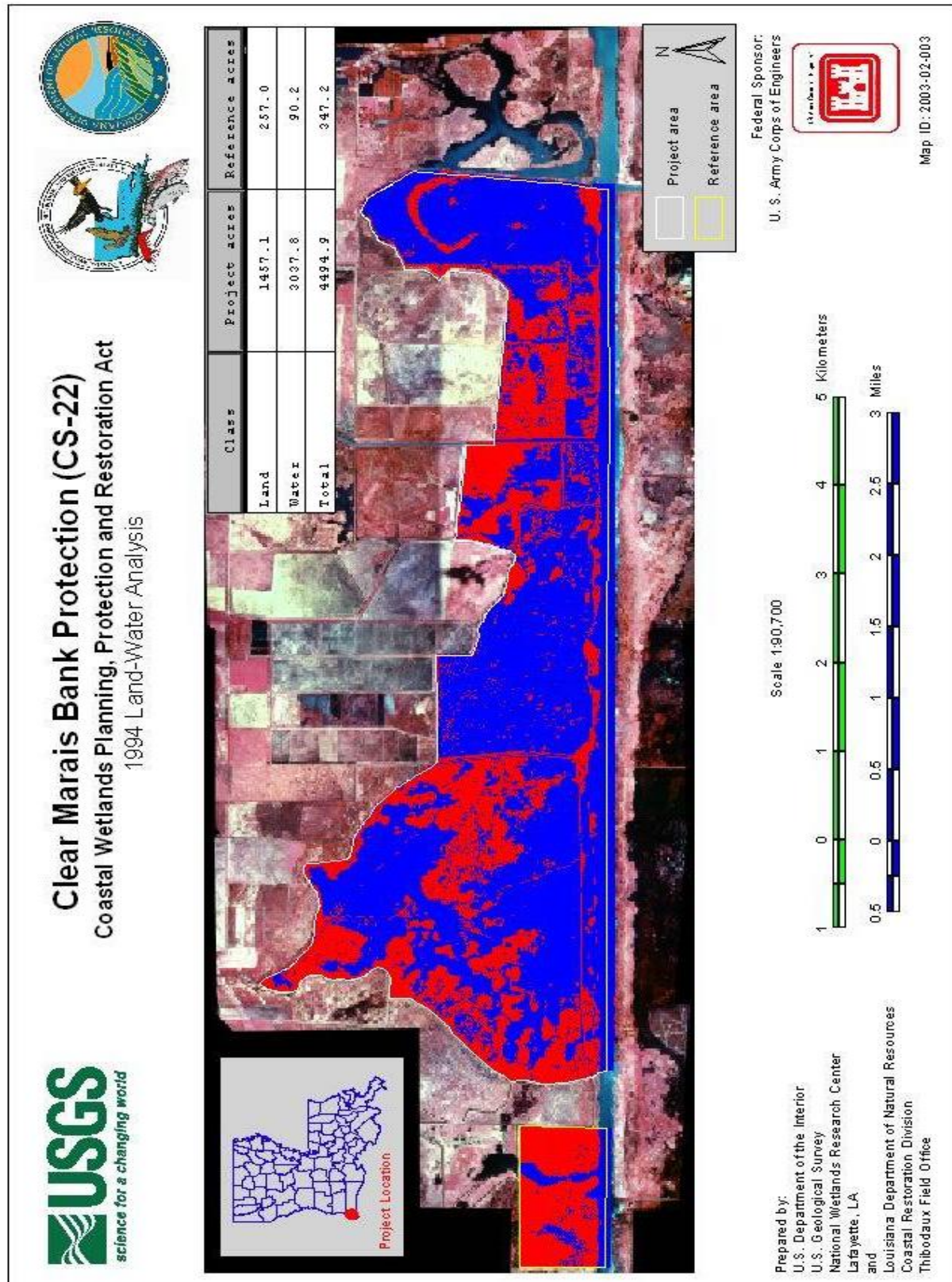
### **Shoreline Change:**

Data were collected in May 1997 (as-built), May 2000, May 2003, May 2006, June 2010 and October 2015. The data indicate that overall from 1997 to 2015, the project has been effective in preventing erosion within each group (table 1, figure 5). Group A which was experiencing mild erosion prior to construction gained 2.78 ft/yr (.85 m/yr). Group B which was experiencing moderate erosion gained 2.54 ft/yr (.74 m/yr). Group C which was experiencing severe erosion gained 6.58 ft/yr (2.01 m/yr). Overall the project area gained an average of 3.97 ft/yr (1.21 m/yr) as compared to the reference area which was losing an average of -1.13 ft/yr (-0.35 m/yr) up until 2013 when additional rocks were added across the reference area. From 2014 to 2015 the reference area showed a positive gain of .99 ft/yr (.30 m/yr).

Shoreline change rate maps (figures 6-11) indicate a large loss of shoreline in Group C at station CS22-26 from 1997-2000 (figure 6). This is due to the shoreline being located behind a small group of broken islands and 200 to 300 feet behind the rocks. Subsequent years indicate that the shoreline has progressed southward toward the small broken islands. From 2003-2015 the area behind Group C which previously indicated shoreline loss has been curtailed and shoreline gains are now taking place (figure 11). This is due to sedimentation building behind the islands, which

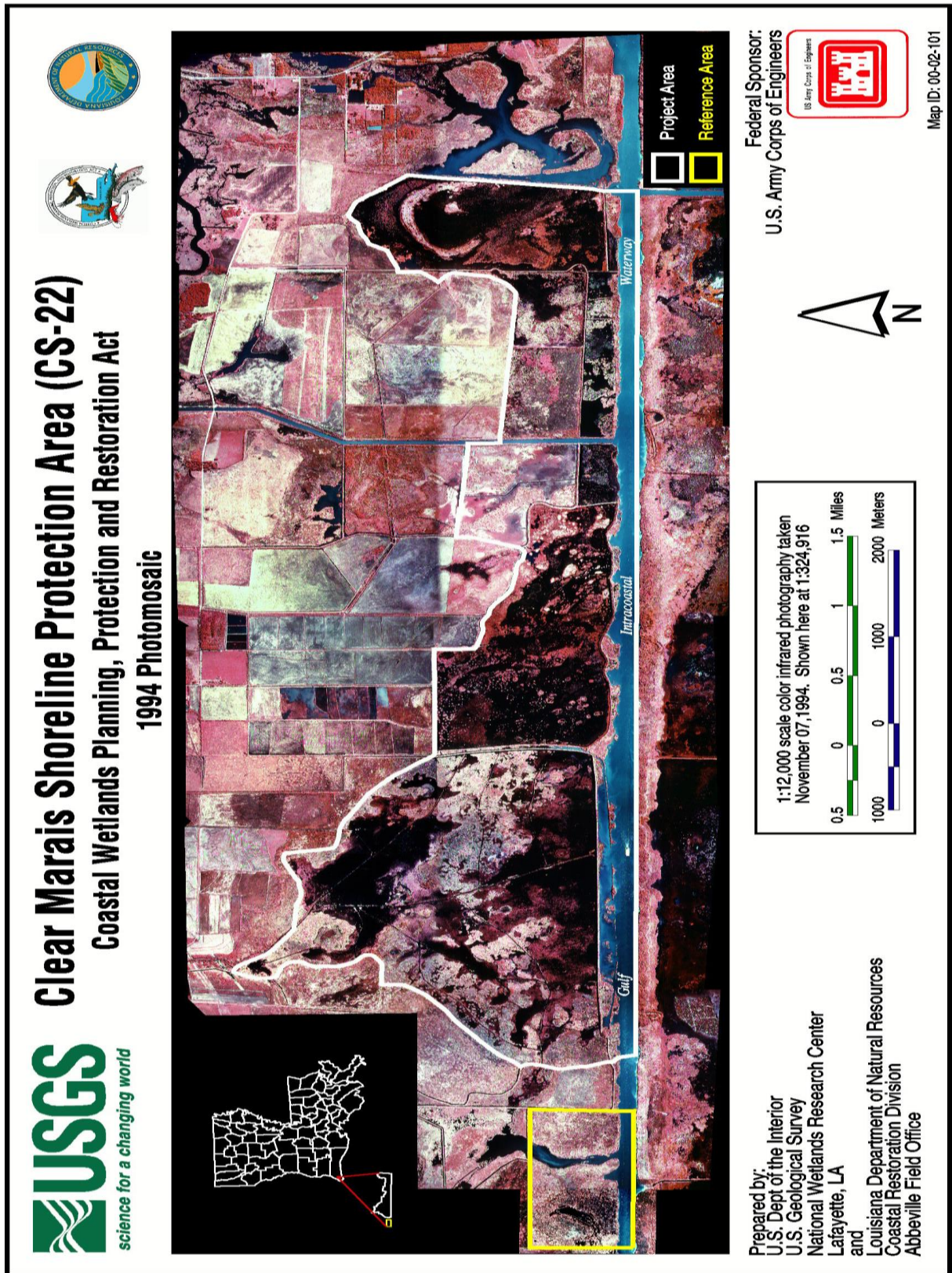


act as a secondary buffer, allowing the vegetation to expand southward toward the islands. The project has been effective in preventing shoreline erosion within each group and within all groups combined. This is supported by the shoreline change rate maps (figures 6-11) which show a decrease in erosion rates over time.



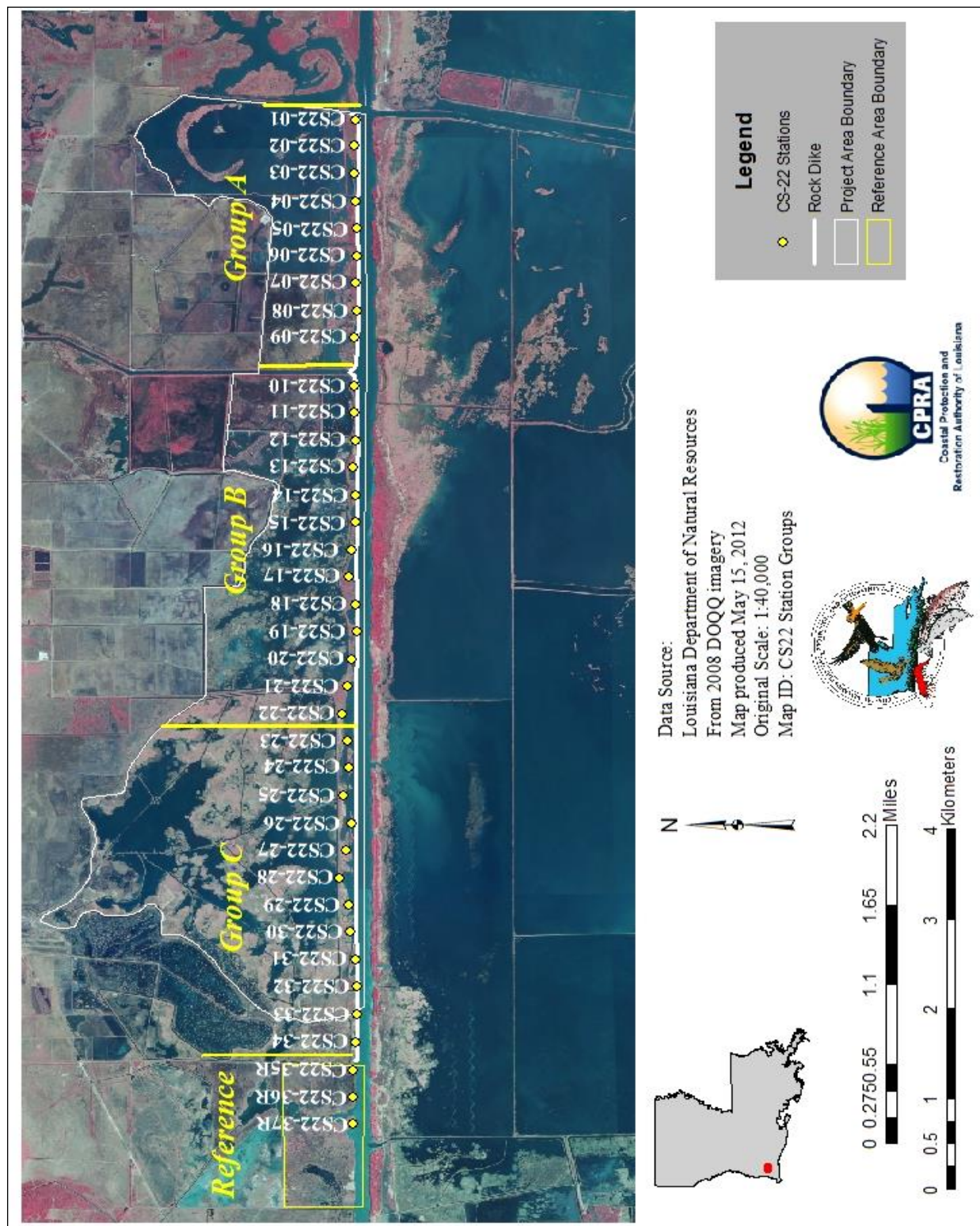
**Figure 2.** Land/water analysis of the Clear Marais Shoreline Protection (CS/22) project and reference areas from aerial photography taken on 11/07/94.



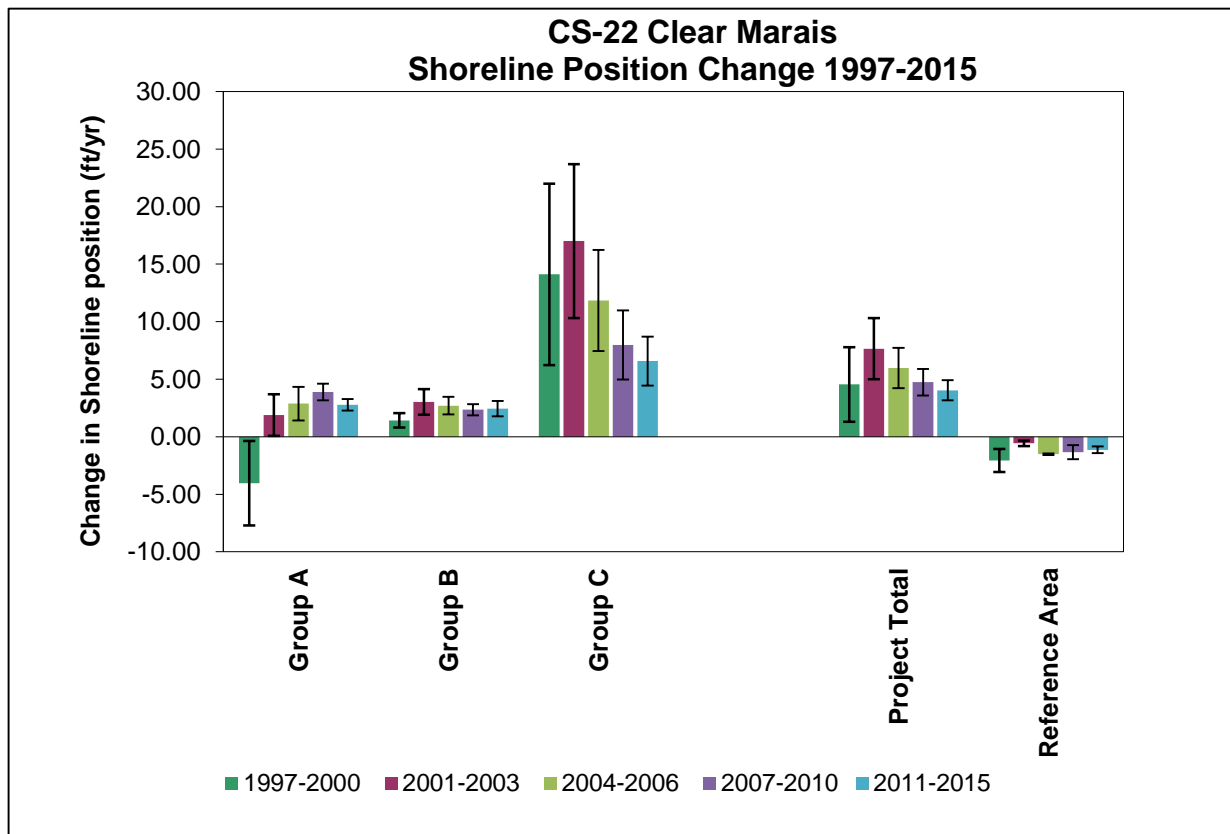


**Figure 3.** Photo-mosaic of the Clear Marais Shoreline Protection (CS/22) project and reference areas from aerial photography taken on 11/07/94.



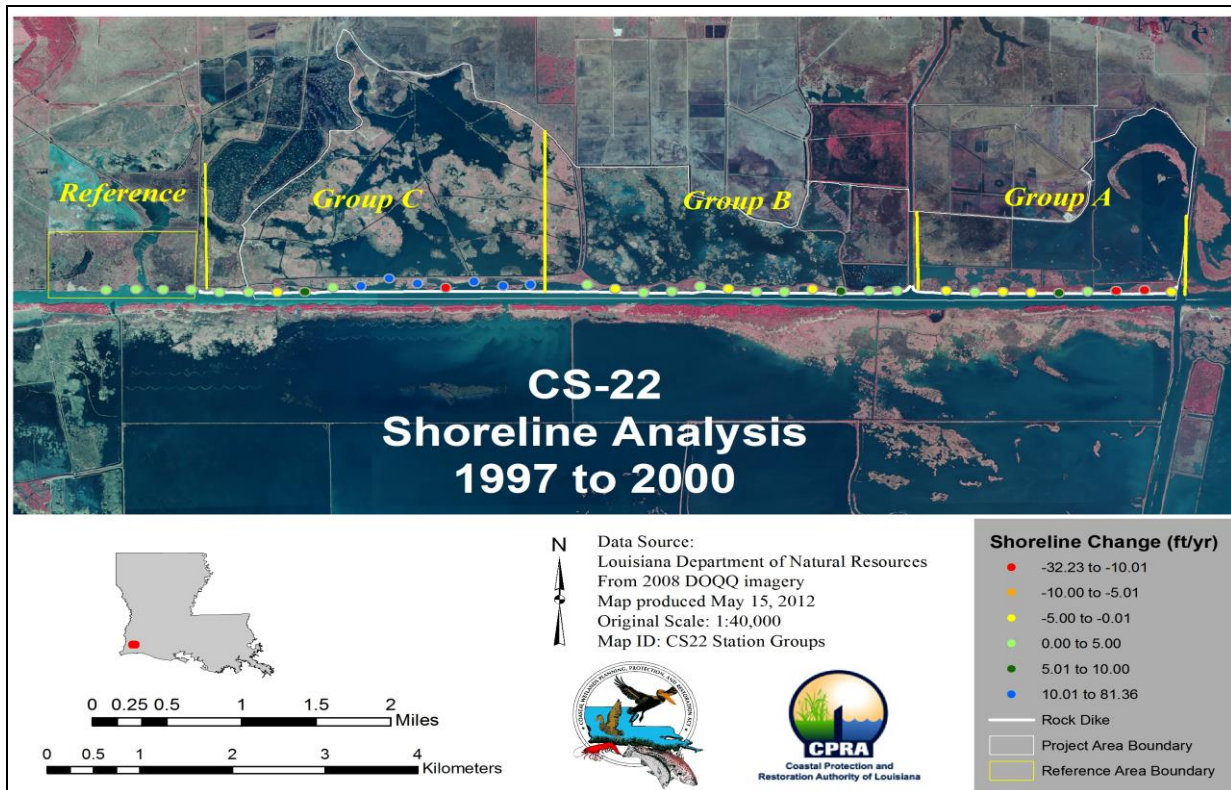


**Figure 4.** Project map showing the location of shoreline marker stations within the project (N=34) and reference (N=5) areas.

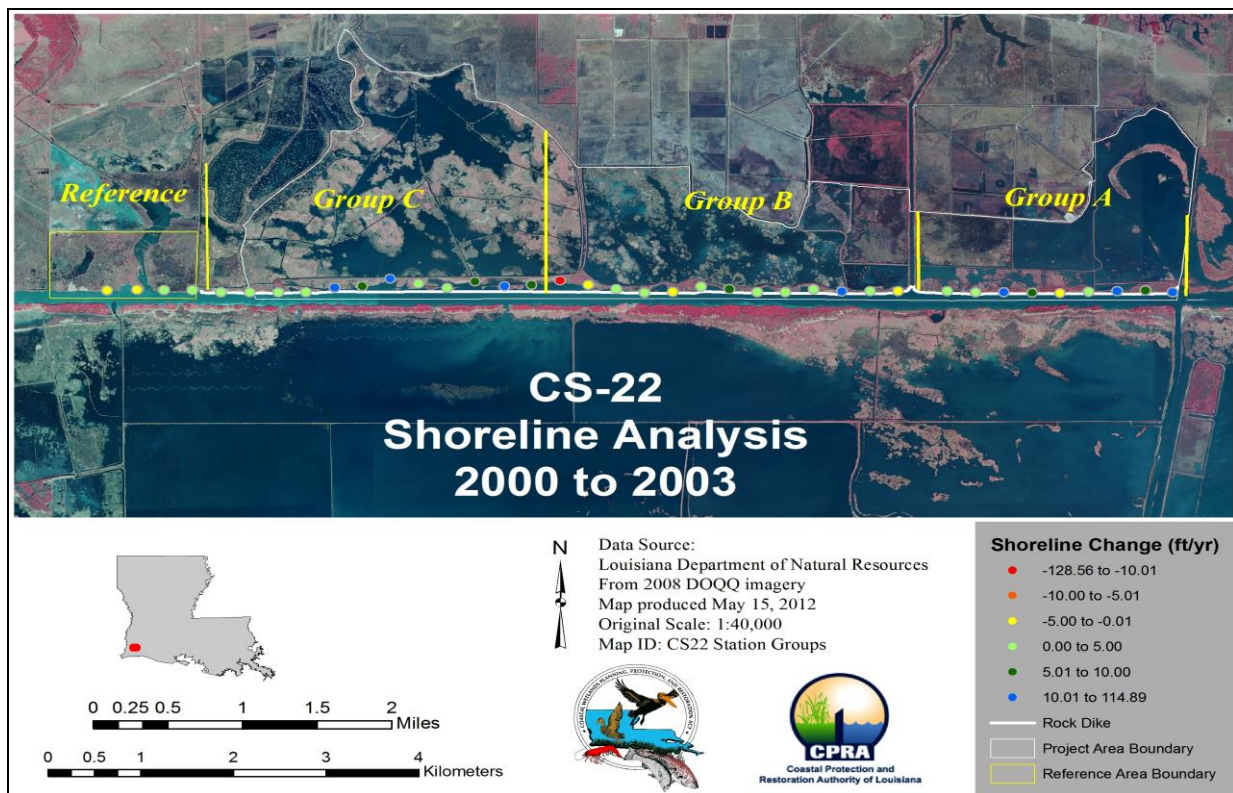


**Figure 5.** CS-22 Shoreline position change (ft/yr) within each group, project total and reference area from 1997-2015.



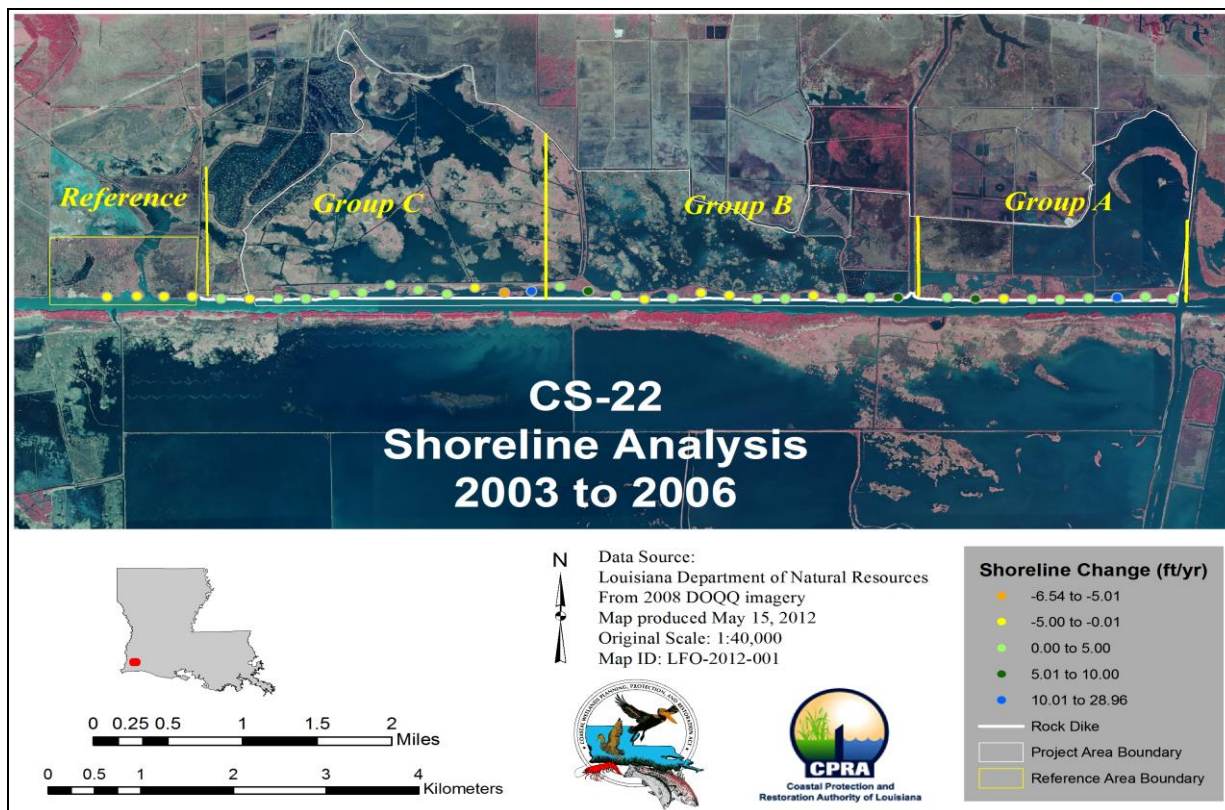


**Figure 6.** Shoreline change rates (ft/yr) within each group and reference area from 1997 – 2000.

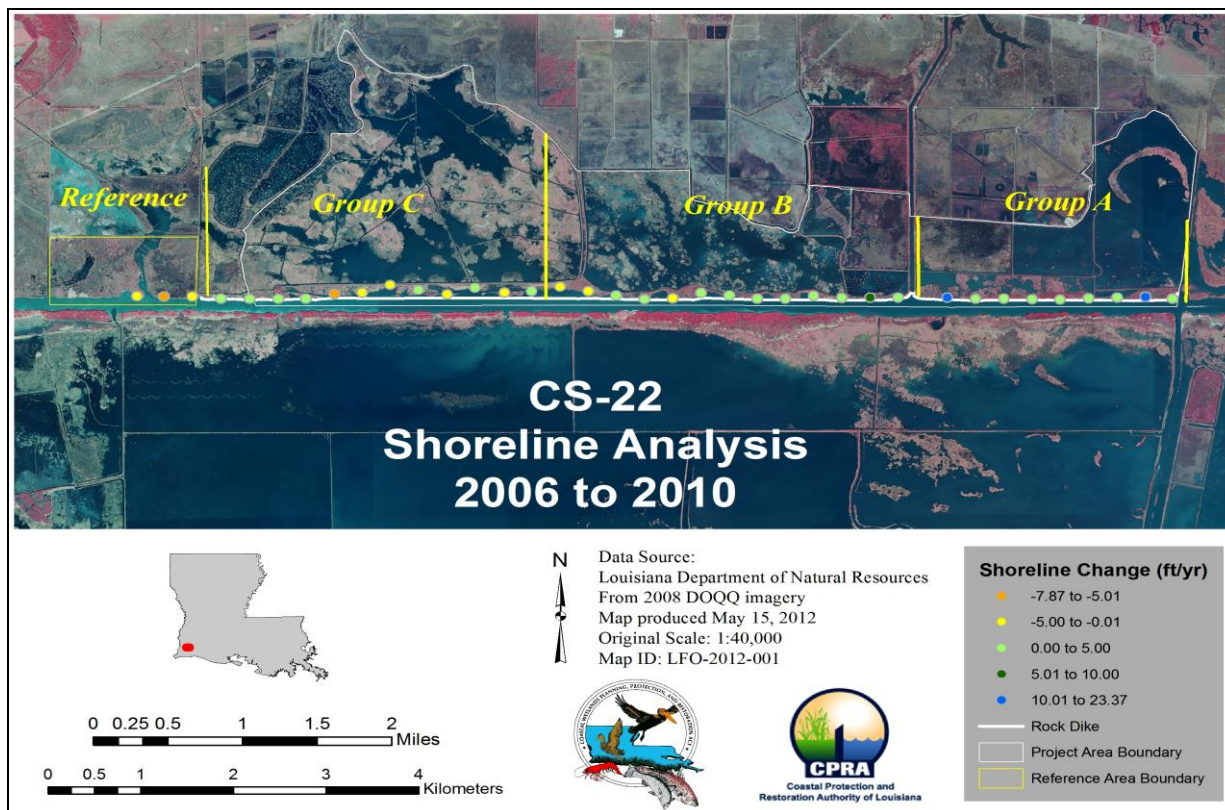


**Figure 7.** Shoreline change rates (ft/yr) within each group and reference area from 2000 – 2003.



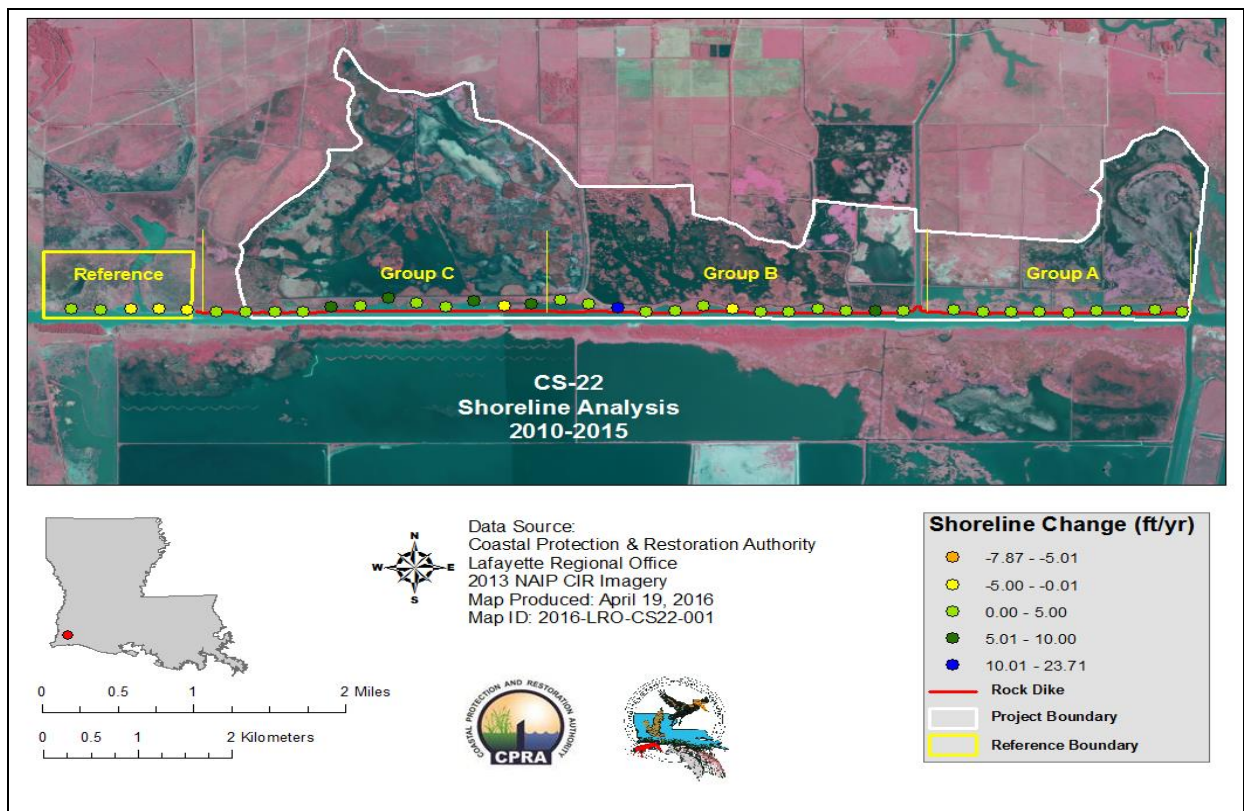


**Figure 8.** Shoreline change rates (ft/yr) within each group and reference area from 2003 – 2006.

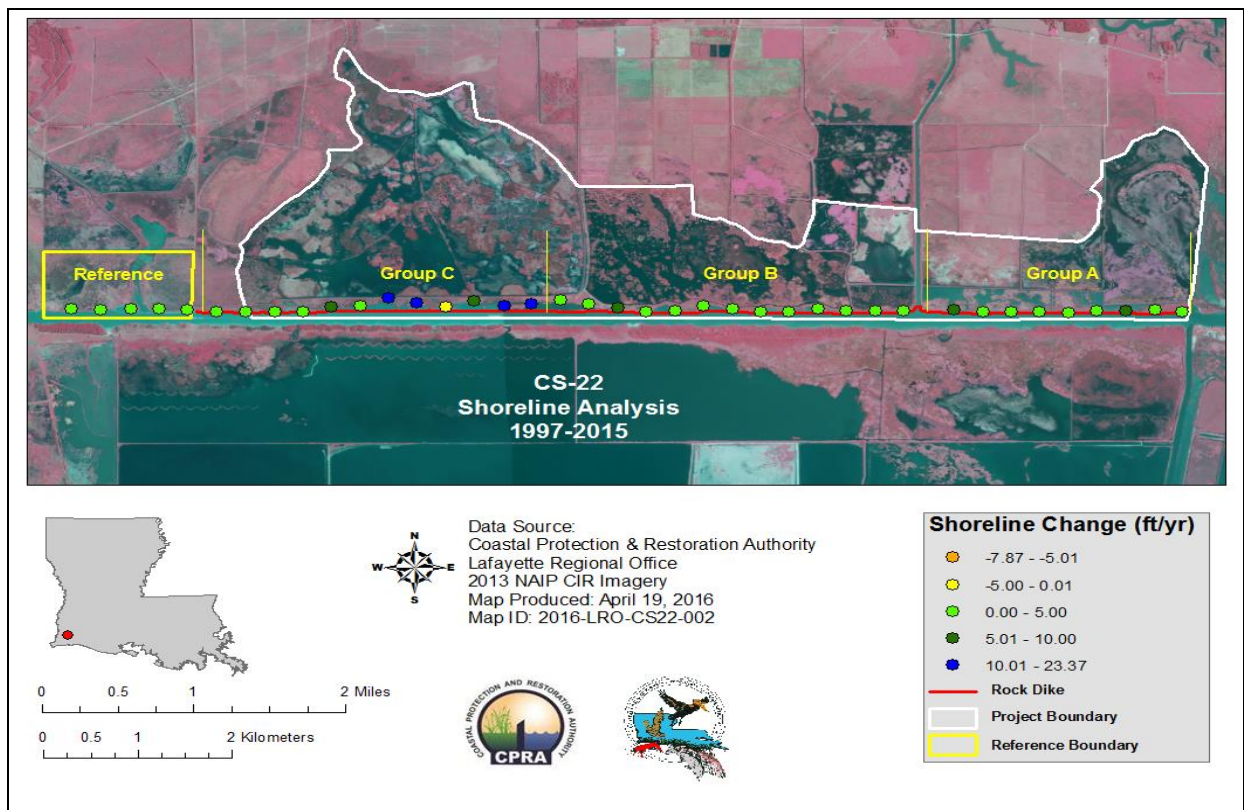


**Figure 9.** Shoreline change rates (ft/yr) within each group and reference area from 2006 – 2010.





**Figure 10.** Shoreline change rates (ft/yr) within each group and reference area from 2010 – 2015.



**Figure 11.** Shoreline change rates (ft/yr) within each group and reference area from 1997– 2015.

## **V. Conclusions**

### **a. Project Effectiveness**

The project has been effective in preventing shoreline erosion within each group and within all groups combined. Overall the project area has gained land as compared to the reference area which is retreating. Visual observations indicates vertical accretion of the wetland area at many locations between the foreshore rock dike and the shoreline, especially where the vegetation has infringed into the rock dike.

### **b. Recommended Improvements**

The rock dike will not continue to be monitored at the end of the 20 year CWPPRA project life; however, a structural assessment survey performed by a licensed engineering/land surveying firm may be needed to evaluate settlement of the rock structure along with accretion on the land side of the rock structure. The survey results will be contained in the final Annual Inspection Report.

An updated GPS secondary monument and staff gauge is recommended within the project area.

### **c. Lessons Learned**

Increase the spacing between settlement plates from 1000 ft to 2000 ft for future monitoring of foreshore rock dikes. The settlement plates incur barge damage and erode at the rock base and become non-functional.

The riser pipe on the settlement plates have been damaged by barges and possible use by vessels for mooring. This could be prevented by reducing the length of the risers.

Based on multiple O & M inspections, the foreshore rock dike has proven to be very effective in reducing shoreline erosion along the GIWW, while experiencing minimal deterioration and requiring no maintenance thus far. The foreshore rock dike was constructed on the (-) 2 contour of the GIWW with no crown, 2:1 side slopes and 650 lb. stone gradation. The plans called for the rock dike to be constructed with no top width. This type typical section with no crown width is impractical to construct due to the size of the stone specified in the contract. Future rock dike construction should specify a minimum crown top width.

## REFERENCES

1993. Calcasieu-Sabine River Basin Study Report. Alexandria, LA: Soil Conservation Service. 152 pp.
- Louisiana Department of Natural Resources (LDNR) 1997 - 2000. Shoreline measurement readings for September 1997 and May 2000 from monitoring stations in the Clear Marais project and reference area established to monitor the Clear Marais (CS-22) project. Abbeville: Coastal Restoration Division, Biological Monitoring Section. Unpublished data.
- Natural Resources Conservation Service (NRCS) 1993. Calcasieu-Sabine cooperative river basin study report. Unpublished report. In cooperation with the Gulf Coast Soil and Water Conservation District, United States Fish and Wildlife Service, Louisiana Department of Natural Resources, Louisiana Department of Wildlife and Fisheries, and Louisiana Department of Agriculture and Forestry. 151 pp.
- Soileau, D., S. Jr. 1995. Clear Marais (CS-22) Monitoring Plan. Unpublished monitoring plan. Baton Rouge: Louisiana Department of Natural Resources, Coastal Restoration Division.
- Steyer, G. D., R. C. Raynie, D. L. Steller, D. Fuller, and E. Swenson. 1995. Quality Management Plan for Coastal Wetlands Planning, Protection, and Restoration Act monitoring program. Open-file series no. 95-01 (Revised June 2000). Baton Rouge: Louisiana Department of Natural Resources, Coastal Restoration Division. 97pp.
- U.S. Department of Agriculture, Soil Conservation Service 1992. Wetland Value Assessment, Alexandria, LA.: Soil Conservation Service. 3 pp.



## **Appendix A**

### **Inspection Photographs**



**Photo No. 1, Typical Rock Dike (June 13, 2013)**



**Photo No. 2, Vegetation behind Rock Dike (June 13, 2013)**



**Photo No. 3,** Connection at west end of CS-22 and Calcasieu Parish CIAP rock dike  
(June 13, 2013)

## **Appendix B**

### **Three Year Budget Projection**

**CLEAR MARAIS SP / CS22 / PPL2**

**Three-Year Operations & Maintenance Budgets 07/01/2016 - 06/30/2019**

<u>Project Manager</u>	<u>O &amp; M Manager</u>	<u>Federal Sponsor</u>	<u>Prepared By</u>
Pat Landry	Mel Guidry	COE	Mel Guidry

	2016/2017 (-20)	2017/2018 (-21)	2018/2019 (-22)
<b>Maintenance Inspection</b>	\$ 7,057.00	\$ 7,269.00	\$ 7,487.00
<b>Structure Operation</b>			\$ -
<b>State Administration</b>		\$ -	\$ -
<b>Federal Administration</b>		\$ -	\$ -
<b>Maintenance/Rehabilitation</b>			

16/17 Description: Install staff gage.

E&D	\$ 7,500.00
Construction	\$ -
Construction Oversight	\$ -
Sub Total - Maint. And Rehab.	\$ 7,500.00

17/18 Description:

E&D	
Construction	
Construction Oversight	
Sub Total - Maint. And Rehab.	\$ -

18/19 Description:

E&D	
Construction	
Construction Oversight	
Sub Total - Maint. And Rehab.	\$ -

	2016/2017 (-20)	2017/2018 (-21)	2018/2019 (-22)
<b>Total O&amp;M Budgets</b>	<b>\$ 14,557.00</b>	<b>\$ 7,269.00</b>	<b>\$ 7,487.00</b>

<b>O &amp;M Budget (3 yr Total)</b>	<b>\$ 29,313.00</b>
<b>Unexpended O &amp; M Budget</b>	<b>\$ 316,464.00</b>
<b>Remaining O &amp; M Budget (Projected)</b>	<b>\$ 287,151.00</b>



**OPERATION AND MAINTENANCE BUDGET WORKSHEET**  
**CLEAR MARAIS BANK PROTECTION PROJECT / PROJECT NO. CS-22 / PPL NO. 2 / 2016/2017**

DESCRIPTION	UNIT	EST. QTY.	UNIT PRICE	ESTIMATED TOTAL
O&M Inspection and Report	EACH	1	\$7,057.00	\$7,057.00
General Structure Maintenance	LUMP	0	\$0.00	\$0.00
Engineering and Design	LUMP	0	\$0.00	\$0.00
Operations Contract	LUMP	0	\$0.00	\$0.00
Construction Oversight	LUMP	0	\$0.00	\$0.00

**ADMINISTRATION**

LDNR / CRD Admin.	LUMP	0	\$0.00	\$0.00
FEDERAL SPONSOR Admin.	LUMP	0	\$0.00	\$0.00
SURVEY Admin.	LUMP	0	\$0.00	\$0.00
OTHER				\$0.00
<b>TOTAL ADMINISTRATION COSTS:</b>				<b>\$0.00</b>

**MAINTENANCE / CONSTRUCTION**

**SURVEY**

SURVEY DESCRIPTION:	Add staff gage.				
	Secondary Monument	EACH	0	\$0.00	\$0.00
	Staff Gauge / Recorders	EACH	1	\$7,500.00	\$7,500.00
	Marsh Elevation / Topography	LUMP	0	\$0.00	\$0.00
	TBM Installation	EACH	0	\$0.00	\$0.00
	OTHER				\$0.00
	<b>TOTAL SURVEY COSTS:</b>				<b>\$7,500.00</b>

**GEOTECHNICAL**

GEOTECH DESCRIPTION:					
	Borings	EACH	0	\$0.00	\$0.00
	OTHER				\$0.00
<b>TOTAL GEOTECHNICAL COSTS:</b>					<b>\$0.00</b>

**CONSTRUCTION**

CONSTRUCTION DESCRIPTION:					
	Rip Rap	LIN FT	TON / FT	TONS	UNIT PRICE
	Rock Rip rap	0	0.0	0	\$0.00
	Aggregate Surface Course	0	0.0	0	\$0.00
		0	0.0	0	\$0.00
	Filter Cloth / Geogrid Fabric	SQ YD	0	\$0.00	\$0.00
	Navigation Aid	EACH	0	\$0.00	\$0.00
	Signage	EACH	0	\$0.00	\$0.00
	General Excavation / Fill	CU YD	0	\$0.00	\$0.00
	Dredging	CU YD	0	\$0.00	\$0.00
	Sheet Piles (Lin Ft or Sq Yds)		0	\$0.00	\$0.00
	Timber Piles (each or lump sum)		0	\$0.00	\$0.00
	Timber Members (each or lump sum)		0	\$0.00	\$0.00
	Hardware	LUMP	0	\$0.00	\$0.00
	Materials	LUMP	0	\$0.00	\$0.00
	Mob / Demob	LUMP	0	\$0.00	\$0.00
	Contingency	LUMP	0	\$0.00	\$0.00
	General Structure Maintenance	LUMP	0	\$0.00	\$0.00
	OTHER			\$0.00	\$0.00
	OTHER			\$0.00	\$0.00
	OTHER			\$0.00	\$0.00
	<b>TOTAL CONSTRUCTION COSTS:</b>				<b>\$0.00</b>

**TOTAL OPERATIONS AND MAINTENANCE BUDGET: \$14,557.00**

**OPERATION AND MAINTENANCE BUDGET WORKSHEET**  
**CLEAR MARAIS BANK PROTECTION PROJECT / PROJECT NO. CS-22 / PPL NO. 2 / 2017/2018**

DESCRIPTION	UNIT	EST. QTY.	UNIT PRICE	ESTIMATED TOTAL
O&M Inspection and Report	EACH	1	\$7,269.00	<b>\$7,269.00</b>
General Structure Maintenance	LUMP	0	\$0.00	<b>\$0.00</b>
Engineering and Design	LUMP	0	\$0.00	<b>\$0.00</b>
Operations Contract	LUMP	0	\$0.00	<b>\$0.00</b>
Construction Oversight	LUMP	0	\$0.00	<b>\$0.00</b>

**ADMINISTRATION**

LDNR / CRD Admin.	LUMP	0	\$0.00	\$0.00
FEDERAL SPONSOR Admin.	LUMP	0	\$0.00	\$0.00
SURVEY Admin.	LUMP	0	\$0.00	\$0.00
OTHER				\$0.00
<b>TOTAL ADMINISTRATION COSTS:</b>				<b>\$0.00</b>

**MAINTENANCE / CONSTRUCTION**

**SURVEY**

SURVEY DESCRIPTION:					
	Secondary Monument	EACH	0	\$0.00	\$0.00
	Staff Gauge / Recorders	EACH	0	\$0.00	\$0.00
	Marsh Elevation / Topography	LUMP	0	\$0.00	\$0.00
	TBM Installation	EACH	0	\$0.00	\$0.00
	OTHER				\$0.00
	TOTAL SURVEY COSTS:				\$0.00

**GEOTECHNICAL**

GEOTECH DESCRIPTION:					
	Borings	EACH	0	\$0.00	\$0.00
	OTHER				\$0.00
	TOTAL GEOTECHNICAL COSTS:				\$0.00

**CONSTRUCTION**

CONSTRUCTION DESCRIPTION:					
	Rip Rap	LIN FT	TON / FT	TONS	UNIT PRICE
	Rock Rip rap	0	0.0	0	\$0.00
	Aggregate Surface Course	0	0.0	0	\$0.00
		0	0.0	0	\$0.00
	Filter Cloth / Geogrid Fabric		SQ YD	0	\$0.00
	Navigation Aid		EACH	0	\$0.00
	Signage		EACH	0	\$0.00
	General Excavation / Fill		CU YD	0	\$0.00
	Dredging		CU YD	0	\$0.00
	Sheet Piles (Lin Ft or Sq Yds)			0	\$0.00
	Timber Piles (each or lump sum)			0	\$0.00
	Timber Members (each or lump sum)			0	\$0.00
	Hardware		LUMP	0	\$0.00
	Materials		LUMP	0	\$0.00
	Mob / Demob		LUMP	0	\$0.00
	Contingency		LUMP	0	\$0.00
	General Structure Maintenance		LUMP	0	\$0.00
	OTHER				\$0.00
	OTHER				\$0.00
OTHER				\$0.00	
TOTAL CONSTRUCTION COSTS:					\$0.00

**TOTAL OPERATIONS AND MAINTENANCE BUDGET:** **\$7,269.00**

**OPERATION AND MAINTENANCE BUDGET WORKSHEET**  
**CLEAR MARAIS BANK PROTECTION PROJECT / PROJECT NO. CS-22 / PPL NO. 2 / 2018/2019**

DESCRIPTION	UNIT	EST. QTY.	UNIT PRICE	ESTIMATED TOTAL
O&M Inspection and Report	EACH	1	\$7,487.00	\$7,487.00
General Structure Maintenance	LUMP	0	\$0.00	\$0.00
Engineering and Design	LUMP	0	\$0.00	\$0.00
Operations Contract	LUMP	0	\$0.00	\$0.00
Construction Oversight	LUMP	0	\$0.00	\$0.00

**ADMINISTRATION**

LDNR / CRD Admin.	LUMP	0	\$0.00	\$0.00
FEDERAL SPONSOR Admin.	LUMP	0	\$0.00	\$0.00
SURVEY Admin.	LUMP	0	\$0.00	\$0.00
OTHER				\$0.00
<b>TOTAL ADMINISTRATION COSTS:</b>				<b>\$0.00</b>

**MAINTENANCE / CONSTRUCTION**

**SURVEY**

SURVEY DESCRIPTION:					
Secondary Monument	EACH	0	\$0.00		\$0.00
Staff Gauge / Recorders	EACH	0	\$0.00		\$0.00
Marsh Elevation / Topography	LUMP	0	\$0.00		\$0.00
TBM Installation	EACH	0	\$0.00		\$0.00
OTHER					\$0.00
<b>TOTAL SURVEY COSTS:</b>					<b>\$0.00</b>

**GEOTECHNICAL**

GEOTECH DESCRIPTION:					
Borings	EACH	0	\$0.00		\$0.00
OTHER					\$0.00
<b>TOTAL GEOTECHNICAL COSTS:</b>					<b>\$0.00</b>

**CONSTRUCTION**

CONSTRUCTION DESCRIPTION:						
Rip Rap	LIN FT	TON / FT	TONS	UNIT PRICE		
Rock Rip rap	0	0.0	0	\$0.00		\$0.00
Aggregate Surface Course	0	0.0	0	\$0.00		\$0.00
	0	0.0	0	\$0.00		\$0.00
Filter Cloth / Geogrid Fabric	SQ YD	0		\$0.00		\$0.00
Navigation Aid	EACH	0		\$0.00		\$0.00
Signage	EACH	0		\$0.00		\$0.00
General Excavation / Fill	CU YD	0		\$0.00		\$0.00
Dredging	CU YD	0		\$0.00		\$0.00
Sheet Piles (Lin Ft or Sq Yds)		0		\$0.00		\$0.00
Timber Piles (each or lump sum)		0		\$0.00		\$0.00
Timber Members (each or lump sum)		0		\$0.00		\$0.00
Hardware	LUMP	0		\$0.00		\$0.00
Materials	LUMP	0		\$0.00		\$0.00
Mob / Demob	LUMP	0		\$0.00		\$0.00
Contingency	LUMP	0		\$0.00		\$0.00
General Structure Maintenance	LUMP	0		\$0.00		\$0.00
OTHER				\$0.00		\$0.00
OTHER				\$0.00		\$0.00
OTHER				\$0.00		\$0.00
<b>TOTAL CONSTRUCTION COSTS:</b>						<b>\$0.00</b>

**TOTAL OPERATIONS AND MAINTENANCE BUDGET: \$7,487.00**

## **Appendix C**

### **Field Inspection Notes**

# **MAINTENANCE INSPECTION REPORT CHECK SHEET**

Project No. / Name: CS-22 Clear Marais Shore Protection

Date of Inspection: June 13, 2013 Time: 11:00 am

Structure No.

Inspector(s): Stan Aucoin, Mel Guidry, and Darrell Pontiff (CPRA)  
Josh Carson (COE), Franl Chapman and Brandon Samson (NRCS)  
Water Level:

Structure Description: Rock Dike

Type of Inspection: Annual

Weather Conditions: Sunny and Warm

Item	Condition	Physical Damage	Corrosion	Photo #	Observations and Remarks
Steel Bulkhead / Caps	N/A				
Steel Grating	N/A				
Stop Logs	N/A				
Hardware	N/A				
Timber Piles	N/A				
Timber Wales	N/A				
Galv. Pile Caps	N/A				
Cables	N/A				
Signage / Supports	N/A				
Rip Rap (fill) (foreshore dike)	Good			1-3	Good Condition. Some settlement. Two 30 foot gaps noted in dike. Good vegetation behind dike. Calcasieu Parish has constructed a CIAP rock dike that ties into this project.
Earthen Embankment	N/A				

What are the conditions of the existing levees?  
Are there any noticeable breaches?  
Settlement of rock plugs and rock weirs?  
Position of stoplogs at the time of the inspection?  
Are there any signs of vandalism?

